Sound Class 8 Science Extra Questions and Answers

Very Short Answer Type Question

Question 1: Name one animal which can hear ultrasonic sounds.
Answer: Dogs
Question 2: How is sound produced?
Answer: Sound is produced by vibrating objects.
Question 3: How does an object produce sound?
Answer: Sound is produced when an objects vibrates.

Question 4: Name the sound producing organ in humans.

Answer: Voice box (larynx)

Question 5: Name the organs of hearing in our body.

Answer: Our ears are the organs of hearing in our body.

Question 6: Name that part of ear which vibrates when outside sound falls on it.

Answer: Eardrum vibrates when outside sound falls on it.

Question 7: Name the unit used to measure the loudness of sound.

Answer: The loudness is expressed in a unit called decibel (dB).

Question 8: Name the quantity whose unit is ‘hertz’.

Answer: The unit of frequency is called “hertz”.

Question 9: Does any part of the body vibrate when we speak? Name the part.

Answer: Yes, vocal chords vibrate when we speak.

Question 10: On what factor does the pitch of a sound depend?

Answer: The frequency determines the shrillness or pitch of a sound.

Question 11: What is the name of passage in outer ear which carries sound waves to the eardrum?

Answer: The sound is carried through the Ear canal.

Question 12: What is frequency of oscillation?

Answer: The number of oscillations per second is called the frequency of oscillation.

Question 13: What is the audible range of frequencies for human ears?

Answer: For human ear, the range of audible frequencies is roughly from 20 to 20,000 Hz.

Question 14: What is vibration?

Answer: The to and fro or back and forth motion of an object is termed as vibration.

Question 15: How does a sound producing object differ from silent?

Answer: A sound producing object vibrates while a silent does not. We can feel the vibrations by touching them.

Question 16: What brings the sound of a ringing telephone bell to our ears?

Answer: The sound of a ringing telephone bell travel to our ears through the air in the room.

Question 17: What is the length of the vocal cord in men and women?

Answer: The vocal cords in men are about 20mm long. In women these are about 5mm shorter.

Question 18: What does the working of a toy telephone tell us about sound?

Answer: The working of a toy telephone tells us that sound travels through solid substances.

Question 19: Who produces sound of higher pitch: a man or a woman? Why?

Answer: Usually the voice of a woman has a higher frequency and therefore, produces a sound of higher pitch.

Question 20: Name three characteristics which are used to describe oscillations.

Answer: Frequency, amplitude and frequency are the three characteristics which are used to describe oscillations.

Question 21: What is musical sound? Give example.

Answer: Musical sound is one which is pleasing to the ear. Sound produced by a harmonium is a musical sound.

Question 22: What is noise pollution?

Answer: Presence of excessive or unwanted sounds in the environment is called noise pollution.

Question 23: What is amplitude of oscillation?

Answer: The maximum displacement of a vibrating object from its central position is called the amplitude of oscillation.

Question 24: Why can ultrasound not be heard by humans?

Answer: Ultrasound cannot be heard by humans because the ultrasound equipment works at frequencies higher than 20,000 Hz.

Question 25: What is the relation between ‘time-period’ and ‘frequency’ of an oscillating body?

Answer: Time Period given by the inverse of the frequency.
Time Period = 1/frequency

Question 26: Name one solid, one liquid and one gas through which sound can travel.

Answer: Solid: Metal (Iron, Steel, Aluminium), wood, bricks etc.
Liquid: Water
Gas: Air

Short Answer Type Questions

Question 1: Why a sound cannot be heard on the moon?

Answer: A sound cannot be heard on the moon because on the moon there is no medium such as air though which the vibrations can propagate.

Question 2: Why should we not put a sharp, pointed or hard thing into our ears?

Answer: We must never put a sharp, pointed or hard thing into our ear. It can damage the eardrum. The damaged eardrum can impair hearing.

Question 3: How is sound produced in mridangam?

Answer: When we strike the membrane of a mridangam, the sound that we hear is not only that of the membrane but of the whole body of the instrument.

Question 4: What differences will you hear in a sound if there is an increase in (i) amplitude, and (ii) frequency?

Answer: (i) The sound will become loud on increasing the amplitude.
(ii) The sound will become shrill on increasing the frequency.

Question 5: A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.

Answer: Frequency = (Number of Oscillations)/Time
= 40/4
= 10 Hz

Time period = 1/(Frequency of Oscillation)
= 1/10
= 0.1 sec

Question 6: Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later. Can you explain?

Answer: Speed of the light is more than the speed of sound. Thus, Lightning is seen earlier and thunder is heard later.

Question 7: Whose voice is more shriller: a baby or a woman?

Answer: The voice of a baby has a higher frequency (or higher pitch) than that of a woman due to which the voice of a baby is even more shrill than that of a woman.

Question 8: How does sound of a bird differ from roar of a lion?

Answer: A bird makes a high-pitched sound whereas a lion makes a low-pitched roar. However, the roar of a lion is very loud while the sound of the bird is quite feeble.

Question 9: Which produces sound of a higher pitch: a drum or a whistle? Why?

Answer: A drum vibrates with a low frequency. Therefore, it produces a low-pitched sound. On the other hand, a whistle has a high frequency and therefore, produces a sound of higher pitch.

Question 10: What frequency can dogs hear but not humans?

Answer: Some animals can hear sounds of frequencies higher than 20,000 Hz. Dogs have this ability. The police use high frequency whistles which dogs can hear but humans cannot.

Question 11: Can sound travel through a vacuum? Why or why not?

Answer: Sound cannot travel through a vacuum. A vacuum is an area without any air, like space. So, sound cannot travel through space because there is no matter for the vibrations to work in.

Question 12: How does loudness depend on the amplitude of vibrations?

Answer: Loudness of sound is proportional to the square of the amplitude of the vibration producing the sound. For example, if the amplitude becomes twice, the loudness increases by a factor of 4.

Question 13: How is sound produced in Sitar?

Answer: When we pluck the string of an instrument, like the sitar, the sound that we hear is not only that of the string. The whole instrument is forced to vibrate, and it is the sound of the vibration of the instrument that we hear.

Question 14: Why are the voices of men, women and children different?

Answer: The vocal cords in men are about 20mm long. In women these are about 5mm shorter. Children have very short vocal cords. This is the reason why the voices of men, women and children are different.

Question 15: How can you show that a sounding tabla is vibrating?

Answer: If we put some grains on the membrane of sound producing tabla, the grains will start jumping up and down showing that the tabla membrane is vibrating while producing sound.

Question 16: How can we distinguish between a man’s voice and a woman’s voice even without seeing them?

Answer: We can distinguish between a man’s voice and a woman voice even without seeing them. This is because the voice of a woman has a higher frequency and is shriller than that of a man.

Question 17: What can be done along the roads to reduce noise pollution caused by traffic from reaching the residents of the area?

Answer: Trees must be planted along the roads and around buildings to cut down on the sounds reaching the residents, thus reducing the harmful effects of noise pollution.

Question 18: State one observation from everyday life which shows that sound travels slower than light.

Answer: Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later. This shows that sound travels slower than light.

Question 19: What are called inaudible sounds?

Answer: The fact is that sounds of frequencies less than about 20 vibrations per second (20 Hz) and higher than about 20,000 vibrations per second (20000 Hz) cannot be detected by the human ear. Such sounds are called inaudible sounds.

Question 20: How is pitch related to frequency?

Answer: The frequency determines the shrillness or pitch of a sound. If the frequency of vibration is higher we say that the sound is shrill and has a higher pitch. If the frequency of vibration is lower, we say that the sound has a lower pitch.

Question 21: The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of the vibration?

Answer: Time period = 1/(Frequency of Oscillation)
Frequency of oscillations = 500 Hz
Time period = 1/500 = .002 s

Question 22: What is the frequency of a vibrating body whose time-period is 0.05 second?

Answer: Time period = 1/(Frequency of Oscillation)

Or, Frequency = 1/ Time period
= 1/0.05 second
= 20 Hz

Question 23: By how much will the loudness of a sound change when the amplitude of vibrations is: (a) doubled? (b) halved?

Answer: (a) If the amplitude of vibrations is doubled, then the loudness will become four times.

(b) If the amplitude of vibrations is halved, then the loudness will become one-fourth.

Question 24: Write the loudness of the following in decibels: Normal breathing, Soft whisper (at 5m), Normal conversation, Busy traffic and Average factory

Answer: Normal breathing – 10 dB
Soft whisper (at 5m) – 30 dB
Normal conversation – 60 dB
Busy traffic – 70 dB
Average factory – 80 dB

Question 25: Identify the part which vibrates to produce sound in the following instruments: (a) Dholak (b) Sitar (c) Flute (d) Cymbals (e) Veena (f) Tabla

Answer: Dholak – stretched membrane
Sitar – strings
Flute – air columns
Cymbals – metal plates
Veena – strings
Tabla – stretched membrane

Long Answer Type Questions

Question 1: Your parents are going to buy a house. They have been offered one on the roadside and another three lanes away from the roadside. Which house would you suggest your parents should buy? Explain your answer.

Answer: I would suggest my parents to buy the house which is three lanes away from the roadside because being away from the road will reduce noise pollution caused by heavy traffic on the road. The intensity of noise decreases with the distance between the source and the listener.

Question 2: Explain in what way noise pollution is harmful to humans.

Answer: Presence of excessive noise in the surroundings may cause many health related problems. Lack of sleep, hypertension (high blood pressure), anxiety and many more health disorders may be caused by noise pollution. A person who is exposed to a loud sound continuously may get temporary or even permanent impairment of hearing.

Question 3: What is the frequency of the sound produced when the vocal cords are: (a) tight and thin? (b) loose and thick?

Answer: Muscles attached to the vocal cords can make the cords tight or loose.

(a) When the vocal cords are tight and thin, a sound of high frequency (high pitch sound) is produced.

(b) The frequency produced by tight and thin, a sound of low frequency (low pitch sound) is produced.

Question 4: How do we hear?

Answer: The shape of the outer part of the ear is like a funnel. When sound enters in it, it travels down a canal at the end of which a thin membrane is stretched tightly. It is called the eardrum. The eardrum is like a stretched rubber sheet. Sound vibrations make the eardrum vibrate. The eardrum sends vibrations to the inner ear. From there, the signal goes to the brain. That is how we hear.

Question 5: List sources of noise pollution in your surroundings.

Answer: Some sources of noise pollution are as follows:

- Running of mixer and grinder
- Blowing of horns of motor vehicles
- Bursting of crackers
- Taking off and landing of aeroplanes
- Sounds of loudspeakers
- High volumes in televisions and transistors

Question 6: What is the difference between noise and music? Can music become noise sometimes?

Answer: Noise: The unpleasant sounds around us are called noise.

Example:

- Running of mixer and grinder
- Blowing of horns of vehicles
- Bursting of crackers

Music: The sounds which are pleasant to hear are called music.

Example: Sounds from musical instruments such as harmonium, sitar, guitar, flute etc.
If a musical sound becomes too loud, it would become noise.

Question 7: Sketch larynx and explain its function in your own words.
Or
Describe how sound is produced by the human voice box (or larynx).

Answer: In humans, the sound is produced by the voice box or the larynx. It is at the upper end of the windpipe. Two vocal cords are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the passage of air. When the lungs force air through the slit, the vocal cords vibrate, producing sound.

Question 8: State the various measures which can be taken to control noise pollution in our surroundings.

Answer: Measures to limit noise pollution

- Silencing devices must be installed in air craft engines, transport vehicles, industrial machines and home appliances.
- Use of automobile horns should be minimised.
- The noisy operations must be conducted away from any residential area.
- Noise producing industries should be set up away from such areas.
- TV and music systems should be run at low volumes.

Question 9: How can you show that sound cannot travel through a vacuum?

Answer: Take a metal glass tumbler. Place a cell phone in it. Ask your friend to give a ring on this cell phone from another cell phone. Listen to the ring carefully. Now, surround the rim of the tumbler with your hands. Put your mouth on the opening between your hands. Indicate to your friend to give a ring again. Listen to the ring while sucking air from the tumbler. You will observe that the sound become fainter as you suck. If you had been able to suck all the air in the tumbler, the sound would stop completely. Actually, sound needs a medium to travel. When air has been removed completely from a vessel, it is said

that there is vacuum in the vessel. The sound cannot travel through vacuum.

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